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# USSR Report

## CONSTRUCTION AND EQUIPMENT

No. 47

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CONSTRUCTION

UDC 69.003 : 658.012.2

## GOSSTROY OFFICIAL DEMINOV ON CONSTRUCTION CHALLENGES

Moscow EKONOMIKA STROITEL'STVA in Russian No 5, May 81 (signed to press 5 May 81) pp 13-18

[Article by USSR Gosstroy First Deputy Chairman A. D. Deminov: "New Frontiers for Construction Workers"]

[Text] From 23 February through 3 March, the 26th Congress of the Communist Party of the Soviet Union worked in Moscow, in the Kremlin Palace of Congresses. These days, each Soviet person lives and labors under the profound impact of the historical resolutions of the congress and of the report by Comrade L. I. Brezhnev, General Secretary of the CPSU Central Committee.

The Leninist Party Congress elicited enormous interest and a most lively response among Soviet people, laborers of the countries of the socialist community and all of progressive mankind.

As a congress participant, I should like to emphasize that the determining feature of its whole atmosphere was unanimity, testifying to the monolithic unity of communists and the entire Soviet people around the party Central Committee and its Politburo, headed by that outstanding furtherer of the cause of Lenin and Great October and CPSU Central Committee General Secretary, Comrade Leonid Il'ich Brezhnev.

The party has always paid a great deal of attention to questions of developing and perfecting capital construction.

The "Basic Directions of USSR Economic and Social Development in 1981-1985 and up to 1990" were approved at the congress.

Now that concrete directives for the future have been set, carrying them out becomes the focus of all our efforts.

The 11th Five-Year Plan, one feature of which is that the increment in labor resources is being reduced and expenditures associated with mastering the East and North are being increased, and much preparation will be required to do the increasing work needed to renovate and retool enterprises, which will seriously test construction workers.

But I suppose the primary cause of current difficulties, shortcomings and unsolved problems in developing the economy, the Accountability Report stressed, is that we have still not overcome the inertia, traditions and habits which evolved during that period when it was not so much qualitative as quantitative aspects which were at the fore.

The primary task of party economic strategy in the current five-year plan is to ensure continued growth in the well-being of the Soviet people.

The basic direction of capital construction in 1981-1985 will be to increase production potential on a new technical basis. In this regard, the 18-20 percent increase in national income must be ensured with a lesser absolute and relative increment in capital investments (12-15 percent) than in the preceding five-year plan. That means that only intensive factors must be brought into play in construction: the entire increment in construction production volume must be obtained through labor productivity growth (15-17 percent), with the same or fewer workers. For comparison, let me note that this most important indicator was underfulfilled in the 10th Five-Year Plan, so an additional roughly 400,000 workers had to be enlisted in the construction sphere.

For builders and workers in construction industry and building materials industry, carrying out the resolutions of the congress in the area of capital construction means first of all ensuring the unconditional start-up of fixed assets and production capacities within the established schedules. And these are very taut assignments. Suffice it to say that in 1981 alone, we are faced with increasing coal capacities by 520,000 tons, pig iron by 420,000 tons, rolled metal by 500,000 tons, freight cars by 400 and excavators by 200, ceramic tile by 1.3 million square meters, and so on.

There is no need to prove the enormous impact of retooling and renovation, as it is a special form of reproduction of production assets, often done without expanding existing sites.

In our country, there are upwards of 45,000 operating enterprises. Under the complex demographic conditions we have, the sole true path to ensuring labor productivity growth and accelerating the recovery of funds and expenditures is active work associated with renovating and retooling enterprises. However, much still remains to be done here to significantly increase capital investments in renovation and retooling in the five-year plan. Ministries and client departments must thoroughly survey the technical condition of buildings, installations and equipment and simplify procedures for developing and approving documentation and opening up financing; construction ministries and departments must prepare the necessary normative documentation, create specialized construction-installation subdivisions and equip them with appropriate equipment, attachments, machinery and tools, and organize the release of special and often nonstandard materials, items and components; the machine building ministries, and foremost the Ministry of Construction, Road and Municipal Machine Building, must quickly organize the series production of special vehicles for operation under especially difficult conditions, and in particular, the production of much-needed short-base chassis cranes and excavators.

Much attention is paid in the "Basic Directions of USSR Economic and Social Development in 1981-1985 and up to 1990" to further improving design-estimate work, and for good reason. Raising the technical level of enterprises and installations, improving the economy of operation of projects being built and the use of scientific and technical achievements and advanced experience in construction -- all this begins with the design and estimate and is, in the final analysis, one of the most important prerequisites of efficiency in capital construction. The task has now been set of monitoring more strictly economy in labor expenditures and material-technical resources, especially metal, timber and cement, along with lowering construction costs, when working out design resolution variants.

It is no less important to focus the attention of designers on the fact that designs for subsidiary-auxiliary buildings and installations lag seriously in terms of construction industrialization. For example, the labor intensiveness of putting up one cubic meter of such services is several times higher than that for basic production facilities, and the proportion of manual labor is about 60 percent.

The use of model design resolutions, and especially of standardized resolutions which are used repeatedly, is of great importance in construction. Even with such designs, enterprises of the same type are often built using individual designs in a number of branches, causing an increase in estimated cost and increasing construction and start-up times. More extensive use should be made of model designs, as well as of designs which have recommended themselves well for repeated use.

Along with this, we need to increase the responsibility of ministries, departments and expert evaluation agencies for ensuring high technical and economic levels in design resolutions and high-quality lay-out, architectural and construction resolutions.

Comrade L. I. Brezhnev noted in his report at the congress that civil construction needs improvement. It is no secret that insufficient attention has been paid to questions of architecture and variety of finishes in housing, and especially in large-panel, large-module and prefabricated modular designs, although there have been good opportunities for doing so. Construction workers in Moscow, Leningrad, Kiev, Alma-Ata, Khar'kov, Tashkent and many other cities are now using 10-12 different types of materials and items for finishing building facades, for example. This experience must be imitated everywhere. As the volume of large-panel house building and the release of industrial components have grown, industrial methods of finishing building and structure facades have taken on increasing importance. Plant technology is called upon to play an important role not only in increasing the degree of factory finish on outside wall panels, but also in giving buildings individuality, a unique coloring, and thus ensure a higher overall architectural-artistic level of large-scale housing and civil construction.

Much needs to be done this five-year plan to improve construction quality.

Here, too, we need to begin with the design. Suffice it to say that upwards of half the large-panel housing is now being built using obsolete designs. As before, numerous deviations from designs and violations of construction norms and regulations are being permitted.

Certain construction organizations are permitting the start-up of projects with unfinished or poor-quality work, which not only hampers utilization of the capacities, but also leads to the release of poor-quality output. For example, the Krasnoyarsk Building Components Combine, which was put into operation in 1978, is operating at only 30 percent of anticipated design capacity due to major omissions in finishing work.

And how disappointing it is for people to move into a new apartment building and find that the windows and doors do not close properly, that the walls are very uneven, the floors are buckled and the utilities work poorly.

The 26th CPSU Congress paid a great deal of attention to the distribution of productive forces. In this connection, continued development and formation of territorial-production complexes (TPC) and industrial centers was outlined, especially for regions now being mastered.

Territorial-production complexes enable us to ensure more proportional development of the union republic and economic region economies, to perform large-scale work on mastering their natural and labor resources and to accelerate growth in their economic potential. The current five-year plan outlines continued formation of the Timano-Pechora territorial-production complex based on fuel-energy, ore and timber resources, and development of the West Siberian, Kansko-Achinsk, Sayansk, South Yakutsk, Pavlodar-Ekibastuz, South Tajik and other complexes.

Ten years of experience in planning and building industrial centers has demonstrated that the siting of several enterprises with common auxiliary facilities and utilities in one place permitted a 1.5 billion ruble reduction in construction costs and a reduction in the amount of land needed to develop the vicinity. Annual operating expenditures at the industrial centers already in operation decreased by 280 million rubles. In the 11th Five-Year Plan, we anticipate actualizing more than 350 industrial centers, to be comprised of about 5,000 enterprises.

However, as concerns shaping the composition of industrial centers and transferring participating ministry funds to the lead developer to build center-wide facilities, and as concerns transferring finished center-wide facilities (boiler rooms, garages, storage facilities, utilities, and so forth) for operation, bureaucratic red tape has still not been overcome. That is why we need to work out in the near future a statute regulating procedures for resolving questions which arise and to grant the lead developers of industrial centers certain privileges.

And what are the ways of further intensifying capital construction, the reserves for accelerating it?

First, we should radically alter our approach to solving many problems in using the achievements of science, engineering and leading experience in construction. The development of science and engineering must be subordinated to accelerating the changeover of construction onto an intensive path of development.

Over the past 10 years, materials and labor expenditures in construction have decreased substantially due to the introduction of progressive technical resolutions and advanced technology. For example, reinforcing steel expenditures per cubic meter of prefabricated reinforced concrete components decreased from 73 to 56 kg. In erecting large-panel housing, 10 percent less steel is required per square meter of total space now than was required 10 years ago.

However, the rate and scale of introduction of scientific-technical achievements in construction still do not correspond to modern requirements, and the technical level is inadequate along a number of important lines.

Construction organizations often fail to ensure the necessary growth in production volume and use of efficient components and parts. The proportion of components made of prestressed reinforced concrete and high-strength concretes has remained practically the same in recent years. In the 10th Five-Year Plan, machine-building plants failed to master the series production of a number of new types of construction machinery and equipment, including trench-diggers, hydraulic jackhammers, large tower cranes, many means of small-scale mechanization, power and ordinary hand tools.

The inadequate scale and rate of introduction of new equipment were among the main reasons construction organizations underfulfilled labor productivity growth and profit assignments in the 10th Five-Year Plan.

A large army of workers in construction is employed in scientific research, technological design and orgtekhstroy [technical construction] organizations. In the current five-year plan, we are faced with transferring these organizations to planning work on the basis of the development and introduction of new equipment using the target program method, which anticipates resolving the most important statewide, territorial and branch tasks of the construction complex first of all.

For example, carrying out the planned most important scientific and technical programs will permit a savings of more than one million tons of metal and 1.8 million tons of cement and the (hypothetical) freeing of nearly 400,000 people for other work in construction in 1985 as compared with 1980.

Second, we also need to continue strengthening the material-technical base of capital construction in every way possible, to improve the training and securing of personnel, and to ensure conformity between the capacities of contractor organizations and the amount of work they do.

A powerful capital construction base has been created here; our country has long since outstripped the most developed capitalist states in terms of production volume for many materials, items and components.

However, many construction and building materials industry enterprises are obsolete in terms of their technical level. Capacities are not being used fully, for example, at plants producing prefabricated reinforced concrete and at house-building combines.

Raising the level of construction industrialization, increasing the degree of factory readiness of components and parts, and expanding the release and use of efficient new items will facilitate carrying out the taut labor productivity growth assignments.

One of the most important prerequisites for improving capital construction efficiency is improvement in the methods and organization of construction production and labor.

The importance of the contract method (now being used to do 87 percent of the construction-installation work) is obvious and need not be explained, but such progressive forms of construction organization as complete-set units, special-effort and nodal-assembly, which have yielded a significant return, currently encompass a relatively small volume of construction.

The complete-set units method does much to facilitate transforming the construction site into an assembly site, to reduce construction time and to put capacities into operation. In order for it to be introduced widely, manufacturers need to increase the factory readiness of the equipment and ensure that it is supplied to construction and installation organizations in unitized sets -- they need to do a great deal of engineering preparation of production, beginning with the design and ending with providing projects with the necessary machines, machinery, means of operational control, and personnel training.

For example, use of the nodal-assembly method ensures a reduction of approximately 14 percent in construction duration and an 8-10 percent decrease in the net cost of construction-installation work.

The resolutions of the party congress state: "Create conditions for universal dissemination of the continuous-flow brigade contract based on a higher level of engineering preparation and production-technological completeness."

More than 77,000 brigades are working by the brigade contract method in construction and are doing about 40 percent of all construction-installation work.

The social and educational role of the brigade contract is great, as it is a clear example of the initiative and creativity of the working man in socialist society. The new method teaches us to work assiduously, to compare expenditures and results obtained, and develops true managers of production. During the 10th Five-Year Plan, the labor productivity of construction workers in contract brigades increased approximately 31 percent, while it increased only five percent in other brigades. It is especially important that all links in the "factory - transport - construction site" construction conveyor now be transferred to the brigade contract and that their work be organized by the flow-line method, following a unified schedule and job authorization.

Another promising direction for further developing the brigade contract is changing over to planning material-technical resources and providing sets of components directly in the brigade, following the example of the UkSSR Ministry of Food Industry's Vinnitspromstroy combine, where material resources are delivered in the needed quantities and following 10-day and daily schedules under the management of a UPTK (production-technological set-providing administration) created especially for this.

It must be noted that the experience of many construction-installation organizations in transferring a number of procurement and prefabricating processes from construction sites to set-assembly bases provides a significant savings in labor expenditures and helps speed up construction.

The prompt organizational-technological preparation of sites for construction is of great importance. Top-priority attention is paid to this question at the leading construction sites: a system is worked out for preparing the site for laying out stock living quarters, laying roads and all underground utilities; surface and subsurface water is drawn off, even to the point of laying special drainage lines; the necessary amount of vehicles and machinery is calculated, as are the necessary assembly and disassembly storage facilities. The construction plan is carefully balanced with material and labor resources.

All these and other measures help make construction and the start-up of planned capacities on schedule a planned process; they help reduce the number of projects being built at any one time and help reduce unfinished construction.

One important direction in which labor productivity in construction is being raised is the reduction in manual labor. For example, about 70 percent of the workers in painting, plastering, concreting and carpentry jobs are performing work manually.

Along with improving labor organization here, it is important to improve the provision of construction sites with highly productive machines, as well as means of small-scale mechanization and well-made hand tools.

Under present conditions, equipping construction organizations with the traditional machines (of small or medium unit power) does not ensure carrying out new technological processes or continued reduction in the labor intensiveness of construction-installation work.

For example, it is now appropriate to use self-propelled scrapers, chain-type and rotary excavators, ripper-cutters, high-impact hydraulic jackhammers and means of hydromechanization in earthmoving work. It is very important to expand the use of excavator-levelers, hydraulic-drive machinery and various types of detachable and drawn equipment.

"Carrying out the assignments of the 11th Five-Year Plan -- this is the criterion on which the work and political qualities of management personnel and their ability to work in the new way will be evaluated," noted Comrade N. A. Tikhonov, Chairman of the USSR Council of Ministers, in his report, "Basic Directions of USSR Economic and Social Development in 1981-1985 and up to 1990." In construction, we need to improve the style and methods of leadership, to increase demandingness, to learn to work more effectively. At many construction sites, and even in the ministries and departments, we need to raise the level of organizational work, attention to business, flexibility and efficiency. The initiative and socialist entrepreneurship of workers at all levels of management should be developed in every way possible.

We are faced with quickly carrying out measures aimed at improving the use of construction machinery, mechanisms and motor transport, with raising the standards of construction production, order and organization at construction sites.

Much work needs to be done to significantly improve labor discipline at construction sites. For example, reducing just the so-called leaves with administration permission by half would be equivalent to enlisting tens of thousands of workers in the sphere of construction production.

In developing socialist competition, creative activeness and initiative, the workers of the millions'strong army of builders are doing everything they can to carry out promptly the historical resolutions of the 26th Congress of our party.

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## MANUAL LABOR REDUCTION PROGRAMS FOR VOROSHILOVGRAD

Moscow EKONOMIKA STROITEL'STVA in Russian No 5, May 81 (signed to press 5 May 81) pp 40-42

[Article by V. G. Fedorenko, construction department head for Voroshilovgradskaya obkom of the Ukrainian Communist Party: "Developing Comprehensive Programs for Reducing Manual Labor"]

[Text] The "Basic Directions of USSR Economic and Social Development in 1981-1985 and up to 1990" adopted by the 26th CPSU Congress anticipate a complex of steps ensuring a significant reduction in expenditures of manual labor in construction.

During the 10th Five-Year Plan, contractor construction organizations of the oblast achieved definite successes in the comprehensive mechanization of difficult, labor-intensive construction jobs and raised the level of mechanization of many construction processes.

A high level of mechanization and comprehensive mechanization of labor intensive jobs were achieved in construction organizations of the Voroshilovgradtyazhstroy, Voroshilovgradzhilstroy and Voroshilovgradkhimstroy combines, in Voroshilovgradsel'stroy trust and elsewhere. A certain amount of work has been done to reduce expenditures of manual labor.

At Voroshilovgradkhimstroy combine, the use of technological sets of means of small-scale mechanization and hand power tools, introduction of the broken flow-line method of work production and internal specialization within subdivisions have provided an opportunity for increasing labor productivity in plastering 1.6-fold from 1972 through 1980. Shift output per brigade member stands at 24-25 $m^2$ today, while 16 $m^2$ was considered high in 1972.

At Voroshilovgradtyazhstroy combine, labor expenditures per 1,000 $m^3$ of concrete poured have been reduced by 127 man-days as a result of the centralized procurement of flat screens and block forms, higher quality earthmoving which eliminated working the surface by hand afterwards, and the use of forms made of box-shaped panels.

This same combine also put into operation an installation to prepare cold roofing compound and asphalt and installations to transport waterproofing material and mechanically apply it to surfaces being sealed. This enabled them to introduce in 1979 installations to apply asphalt to 15,600 $m^2$ of roofing, thus increasing output per worker to 300 $m^2$ per shift, as against 60 $m^2$, to lower roofing costs 1.8-fold, to improve working conditions and work quality.

When the Sukhodol'skaya-Vostochnaya and Nos 1-2 Nagol'chanskaya mines, the largest in the country, were built, Voroshilovgradshakhtostroy combine used an SBL [not further identified] to drill bunton holes in 1977-1980. Use of the SBL permitted achieving placement of supports at a rate of four tiers per day, in spite of the increased shaft depths, while only two tiers per day were possible when charge holes were driven using hammers, increasing tunneler labor productivity 1.3-fold. Some 4,590 man-shifts of heavy manual labor was saved just in placing supports in the main shaft of Nagol'chanskaya Nos 1-2 mine using the SBL machines.

Mechanized concrete pouring using BUK-2 and Monolit-2 units when strengthening horizontal and inclined drifts provides for the combine as a whole an annual reduction of 2,794 man-shifts in labor expenditures for workers employed at manual labor.

The Voroshilovgradzhilstroy combine has increased its volume of fully prefabricated construction in order to reduce expenditures of manual labor, which volume has increased 5.5 percent over the last three years. This same combine has mastered the construction of frame-panel kindergarten and school buildings. Overlapping slabs in combination with joist slabs are used to put up series I-480A, 96 and 121 houses. This resolution permits a reduction in the number of assembly elements and the amount of arc welding.

In order to eliminate labor-intensive finishing work on the surfaces of building fronts, Voroshilovgrad DSK [house-building combine] has introduced a device for the mechanized spackling and finishing of the decorative-protective coatings on outside wall panels. Antratsitovskiy DSK has mastered technology for manufacturing wedge-shaped panels which uses a sublayer made of a cement-clay slurry while they are being shaped. This resolution permits the manufacture of overlap slabs with a finished ceiling surface for painting.

At the same time, it should be noted that the higher level of mechanization achieved in construction organizations of Voroshilovgradskaya Oblast has not always effectively influenced the level of labor mechanization. Growth rates in level of labor mechanization lag significantly behind the rates of growth in level of job mechanization. Thus, for example, given a level of earthmoving work mechanization of 99 percent, more than 16 percent of all those doing these jobs are employed at manual labor. Given a 97 percent level of mechanization of loading and unloading jobs, more than 50 percent of the workers are employed at manual labor. The amount of finishing work being done by mechanized means is 23 to 60 percent, but the amount of manual labor is 60 to 80 percent.

The total number of workers employed at manual labor in contractor construction organizations of the oblast remains high, especially in stonework, concreting and carpentry.

This situation results in considerable measure from the presence in many construction organizations of small construction brigades working by hand and performing primarily small amounts of work.

It is known that construction's requirements for means of small-scale mechanization are still not being met fully (25-30 percent), that the quality of the attachments and tools sometimes fails to meet modern requirements. At the same time, there are significant reserves for improving the effectiveness with which the available means of small-scale mechanization and hand tools are used, by creating a well-developed network of small-scale mechanization sectors, mobile tool centers, by improving technical services, maintenance and providing complete sets of tools, and by a precise system of recording and monitoring their use.

As practice has shown, the effectiveness with which power hand tools are used in construction production is very high. Thus, use of a single tool of average cost, 20 rubles, ensures an annual savings of 100 rubles, and the use of 10 such tools frees one worker for other jobs.

The problem of reducing manual labor is multifaceted and touches on all aspects of the technology and organization of construction production. Raising the level of mechanization leads to improved working conditions and helps reduce personnel turnover in construction. An analysis done in oblast construction organizations showed that the highest personnel turnover existed where manual labor predominated.

According to the CPSU Central Committee and USSR Council of Ministers decree "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Improving Production Efficiency and Work Quality," comprehensive programs for reducing manual labor will become one of the most important component parts of oblast, city, rayon and enterprise economic and social development plans.

At present, much organizational work is being done in oblast construction organizations to draw up comprehensive programs for reducing manual labor in construction in 1981-1985.

The leaders of construction combines, trusts, DSK's, administrations and engineering services have made a detailed record of manual labor in basic and auxiliary jobs and have developed long-range work programs for the 11th Five-Year Plan. Questions of reducing manual labor have been reflected in the socialist obligations of labor collectives and the personal creative plans of the workers.

In developing a comprehensive program, we studied opportunities each construction organization base has for producing power tools and technological accessories and have planned and are implementing steps to provide all brigades with the complete sets of means of small-scale mechanization and hand tools stipulated in the norms. The scientific and design forces of the oblast have been directed to resolve the tasks of reducing manual labor, as has the attention of inventors and efficiency specialists. This work will become more effective if the USSR Gosplan, USSR Gosstroy and machine building ministries pay more attention to increasing the release of efficient electric and pneumatic tools and means of small-scale mechanization.

At present, the oblast is being set the task of further raising the level of mechanization and automation of labor-intensive processes, of introducing progressive technology and efficient materials, of perfecting labor organization and the construction management structure. Reducing manual labor expenditures in construction by just one percent would ensure freeing about 600 oblast workers for other jobs each year.

The development of comprehensive programs for reducing manual labor is being led by the party organizations. A council to supervise this work has been created in the construction department of the party obkom. The UkSSR Gosstroy has formed an oblast scientific-methods office to render construction organizations practical assistance in developing comprehensive programs, using the Voroshilovgrad branch of the NIISP

[Scientific Research Institute of Construction Industry] as a base. In December 1980 alone, NIISP branch specialists held nine territorial-branch seminars on questions connected with reducing manual labor in construction. They encompassed upwards of 500 specialists and supervisory workers at various levels of construction organization management.

Commissions chaired by party gorkom and raykom secretaries have been created to set up work locally.

In implementing the program to reduce manual labor in construction, we will have a positive impact on the content and nature of labor, on change in the occupational skills and social structure of construction collectives, and will provide an opportunity for successfully carrying out the resolutions of the 26th CPSU Congress

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# WAGE FUND PLANNING AND EXPENDITURE MONITORING

Moscow EKONOMIKA STROITEL'STVA in Russian No 5, May 81 (signed to press 5 May 81) pp 42-46

[Article by Candidate of Economic Sciences I. M. Al'tshuller, NIIOUS sector chief, and senior associate V. V. Fefilat'yeva: "Ways of Perfecting Wage Fund Planning and Monitoring Its Expenditure"]

[Text] The "Basic Directions of USSR Economic and Social Development in 1981-1985 and up to 1990" adopted by the 26th CPSU Congress and the CPSU Central Committee and USSR Council of Ministers decree "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Improving Production Efficiency and Work Quality" anticipate implementation of a complex of measures to continue perfecting labor and wage planning, to strengthen material incentives for achieving production end results while increasing the efficiency with which live and embodied labor resources are used.

Two methods approaches to determining labor and wage expenditure indicators are used in labor planning in construction.

The first, that of direct calculation of labor and wage expenditures, is based on the planned volumes of construction-installation work and corresponding planned normatives per unit of each type and variety of work.

As is known, this method determines the essence of all calculations of labor plan indicators as part of the annual construction-finance plan of the construction organization, as well as operational plan indicators.

The method of directly calculating labor indicators can be expressed by the following formulas:

$$L_{pl} = \Sigma q_i t_i \pm \alpha \ , \qquad (1)$$

$$WF_{pl} = \Sigma q_i v_i \pm \beta \ , \qquad (2)$$

where $L_{pl}$ is planned labor expenditures;

$WF_{pl}$ is the planned wage fund;

$q_i$ is work volume of the i-th type in physical or cost terms;

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For discussion

$t_i$, $v_i$ are normatives of labor and wage expenditures per unit of work volume of the i-th type;

$\alpha$, $\beta$ are additional values of savings or growth in expenditures of labor and wages which are taken into account in calculations for attainment of the approved (or necessary) level of labor productivity and wages.

One feature of the normatives of labor and wage expenditures (as distinct, for example, from the normatives of material resources expenditures) is their continuous and rapid aging, in which connection an ever-wider gap is formed over time between indicators determined on the basis of normatives and the level of labor intensiveness (labor productivity) and wages actually achieved. This is probably one of the main causes of the nonviability of the annual construction finance plans worked out (or at least the "labor and wages" section of them).

The enormous efforts by many collectives to develop planned labor and wage expenditure normatives by type of job, structural element, and so forth, have in the end turned out to have been in vain, inasmuch as the above-mentioned $\alpha$ and $\beta$ components must be included in direct calculations of planned labor intensiveness and wages for an assigned volume of work. Various proposals that correction coefficients which take into account labor productivity growth and wage growth in various types of jobs be used as planning normatives also fail to solve this particular problem.

It is permissible and appropriate to use the method of direct calculations of planned labor and wage expenditures in construction-installation administrations only in those instances when dynamic normatives developed in physical terms of construction end or intermediate product on the basis of production calculations are used. For example, planned project normatives (calculations) of labor and wage expenditures which take into account, along with the wages of piece-work workers and time-rate workers, worker bonuses from the wage fund and a number of other labor and wage expenditures necessary to carry out the entire complex of work on the project have been worked out in house-building combines of the Glavmosstroy for many years now.

Experience in developing comprehensive production calculations for standard projects as a whole can probably be used and made the basis for developing planned wage normatives per 1,000 $m^2$ of total housing space and for other standard projects. The calculation method can also be used to determine consolidated base normatives of wage expenditures as a whole for individual nonstandard projects, complexes and types of work.

It is very easy to switch from the normative of wage expenditures in physical terms of construction end product to a normative in cost terms. And it is not important whether estimated price or normative hypothetical net output is used as the measure.

Analysis of the actual use of project normatives must be an important link and stage in their development. Comparing normatives with actual wage expenditures by project provides an opportunity for determining their completeness and practical suitability and for revealing possible reserves for reducing expenditures on the basis of improvements in technology and in organizing production and worker labor.

The method of direct calculation of the labor plan on the basis of plan normatives by work type and complex, by project, and so on, is not, in our opinion, suitable for planning at the ministry, main administration and association levels, and in many instances, at the trust level either.

Proposals by individual specialists and scientific collectives that a far-flung system of aggregated and deaggregated planning normatives for labor and wages be created in construction, and that they include normatives by construction branch, for direct calculation of the labor plan at all levels, from construction administration and trust to ministry and Gosplan, are technically possible and feasible given the present level of development of computer equipment, but they are economically inexpedient and offer nothing practical, including for determining wage expenditures per ruble of construction output, inasmuch as we cannot, objectively, ignore the level of labor productivity and average wage achieved (base figures) in the plans.

The second method of determining planned labor and wage indicators is connected with consideration of the base level of these indicators, as well as with the labor productivity growth and average wage assignments being developed. This method is used most widely in practical planning, from the Gosplan to the construction-installation trusts and administrations. The merits of this method are, in our opinion, precisely what is thought to be a shortcoming in it, that it considers the achieved indicators for labor productivity growth and average wage, which cannot objectively be ignored. One shortcoming we think does give grounds for criticism is that the planning gives inadequate consideration to possible reserves for labor productivity growth in specific construction organizations and to various structural advances in the composition of construction output. Thus, the ways of overcoming the shortcomings in this method are associated basically with improving the substantiation of labor productivity growth assignments.

In our opinion, use of the second of the above methods, including use of the available normative base for a quantitative evaluation of the influence of structural advances in the composition of construction output on the labor intensiveness of construction-installation work, is the most feasible way of working out normatives of wage expenditures per ruble of construction output for the construction ministries and departments.

The determination of wage normatives per ruble of construction output can be expressed by the following formulas:

$$\frac{WF_{pl}}{1\ \text{mil. r.}} = \frac{W_{base} \cdot L_{pl}}{1\ \text{mil. r.}} , \qquad (3)$$

$$W_{pl} = W_{base} \pm \Delta W_{str} + \Delta W_{l.p.g.} , \qquad (4)$$

$$L_{pl} = L_{base} \pm \Delta L_{str} + \Delta L_{l.p.g.} , \qquad (5)$$

where $\frac{WF_{pl}}{1\ \text{mil. r.}}$ is the normative of wages per ruble of construction output, in rubles;

$W_{base}$, $W_{pl}$ are, correspondingly, the base and planned average wage levels per worker per year, in rubles;

$\Delta W_{str}$ is the increment (+) or decrement (-) in average wage per worker per year due to structural advances in the composition of the average wage and number of workers, in rubles;

$\Delta W_{l.p.g.}$ is the increment in average wage according to the planned relationship of labor productivity growth factors, in rubles;

$L_{base}$, $L_{pl}$ are labor expenditures per million rubles of construction output in the base and planning periods, respectively, in man-years;

$\Delta L_{str}$ is the increment (+) or decrement (-) in labor expenditures per million rubles due to structural advances in the composition of construction output, in man-years;

$\Delta L_{l.p.g.}$ is the reduction in labor expenditures per million rubles due to organizational-technical measures to increase productivity, in man-years.

As is evident from the above, resolution of the task of determining a planned normative of wage expenditures per ruble of construction output is broken down into two interconnected blocks: a) definition of the planned level of the average wage per worker in the year and b) determination of the planned level of labor expenditures per million rubles of construction output, in man-years.

It should be noted that the importance and role of the indicator of average wage are currently underestimated, and the level and structure of its elements by category of workers and their dynamics are not being analyzed. This indicator is currently basically a roughly calculated, derivative value determined by dividing the wage fund by the number of workers. At the same time, the indicator of planned level of average wage must be a most important support indicator in planning the wage fund.

Analyzing the base level and structure of the average wage for each category of worker (worker, engineering-technical worker, employee, junior service personnel) is of substantial importance, and it is important to know due to what elements (payments) the average wage of a particular category of workers has increased and which portion of it has increased outside labor productivity growth. This especially concerns the most dynamic portion of wages, the piece-rate bonus and bonuses for piece-rate workers. In this regard, it is appropriate to take into account the tautness of the average wage structure of piece-rate workers in the form of an indicator of the proportion of the rate portion of the wage and bonuses in the whole piece-rate wage (the rate postion, piece-rate bonus and bonuses from the wage fund). A more taut average wage structure for piece-rate workers (a higher proportion) will naturally characterize a closer connection between it and labor productivity and, correspondingly, a lesser amount of unsubstantiated payments.

It should be noted that all the information necessary to analyze the base structure of the average wage can be obtained from statistical reporting. An example of determining the base wage expenditure normative per ruble of construction-installation work is shown in Table 1 (following page).

Other conditions being equal, when shaping the planned average wage level for piece-rate workers, we should anticipate higher rates of growth due to bonuses in those construction organizations in which indicators of wage structure tautness are higher.

Table 1. Example of Summary Calculation of A Base (1980) Wage Expenditure Normative Per Ruble of Construction-Installation Work

| category of workers | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| workers in construction-installation jobs and in subsidiary production, total | 92.1 | 2,085.8 | 192,102 | 19.21 |
| including: | | | | |
| workers | 75.8 | 2,125.7 | 161,131 | 16.113 |
| of these: | | | | |
| piece-rate | 59.55 | 2,153.19 | 128,222 | 12.822 |
| time-rate | 16.25 | 2,025.42 | 32,909 | 3.291 |
| engineering-technical | 12.92 | 2,023 | 26,138 | 2.614 |
| employees | 3.1 | 1,461.8 | 4,531 | 0.453 |
| junior service personnel, security | 0.28 | 1,079.3 | 302 | 0.03 |

Key:

1. Number of workers per million rubles of construction-installation work, in man-years per million rubles
2. Average annual wage, in rubles per man-year
3. Wage fund per million rubles of construction-installation work, in rubles t per million rubles (column 1 times column 2)
4. Wage expenditures per ruble of construction-installation work, in kopecks

As is evident from formula (4), consideration must be given to various structural advances in the composition of the average wage when determining the planned average wage level. These structural changes can be connected with payments of regional coefficients, supplements for work in the Far North or under equivalent conditions, rewards for years of service and other supplements and additional payments from the wage fund.

As is evident from formula (4), when determining the planned average wage level, consideration must be given to the increment in it in accordance with the planned relationship of labor productivity growth factors. In this regard, it should be borne in mind that in terms of its influence on wage increment, labor productivity growth can conditionally be split into two groups.

The first group includes factors dealing with a higher technical level of construction production (increased prefabrication, use of efficient new components and materials and improvements in technology) which reduce the labor intensiveness of doing construction-installation work. Wages increase 0.1 to 0.2 percent for each one-percent increase in labor productivity due to this group of factors.

The second group includes factors aimed at conserving working time and using it more productively on the basis of improved planning, management and organization of production and worker labor. As distinct from factors in the first group (extensive), the second group includes intensive growth factors.

Correspondingly, the wage increment due to the second group of factors must be higher. Wages can grow approximately 0.7 to 0.9 percent for each one-percent increment in labor productivity due to this group of factors.

All this increment can basically be linked only to the increment in piece-rate worker wages.

The planned average wage level per worker in construction-installation jobs and in subsidiary production is determined as a weighted-mean indicator based on the average wage level and proportion of each category of workers.

As is evident from formula (5), determining the planned labor intensiveness per million rubles in construction output is associated both with calculations of the influence of organizational-technical measures to improve labor productivity (a special problem which needs to be examined separately) on lowering labor intensiveness and with quantitative evaluation of the effect of structural advances in the composition of construction output on change in labor intensiveness.

In order to evaluate the influence of structural advances, we need appropriate normatives of labor expenditures per unit of type of work, structural element and per project, work complex, branch and subbranch of construction. Inasmuch as we must in this instance evaluate the influence only of a structural shift, and not determine the overall level of planned labor intensiveness, demands as to normative levels can be reduced, that is, they need not mandatorily reflect the achieved labor productivity level referred to above.

In principle, any available normative base (planned normatives, production calculations, estimated normatives) can be used for quantitative evaluations of the effect of structural advances. It is only important that the exact same normatives be used in the periods (base and planning) being compared.

In our opinion, there are no fundamental changes in the way the wage expenditures normative is determined when we switch to measuring construction output volume on the basis of normative conventional-net output. Only the scale of normative measurement changes. For example, whereas the normative is 20 kopecks per ruble of construction-installation work in estimated prices and the coefficient of normative conventional net output to work volume in estimated prices is 0.4, under the new conditions the normative's value would be 50 kopecks per ruble of normative conventional net output.

It should also be noted that the use of normative conventional net output does not remove the influence of structural advances on labor intensiveness and correspondingly on output. Structural advances have been, are and will be a part of construction output, independently of the measurements used, but using normative conventional net output, the direction of their influence and the scale of the measurement can be different. Therefore, even when using normative conventional net output, the task of quantitatively evaluating the influence of structural advances on the indicator $L_{pl}$ remains a pressing problem.

One feature of planned wage expenditure normatives per ruble of construction output is the fact that they must be worked out for a five-year period, including by year of the five-year plan.

Five-year plan assignments on labor productivity growth and wages on whose basis the coefficients of reduction in wage expenditures per ruble of construction output by year of the five-year plan are set must serve as the basis for developing such dynamic normatives.

Normatives of wage expenditures per ruble of construction by year of the five-year plan ($N_{pl}$) are represented in a general way by the following formula:

$$N_{pl} = N_b K_n \text{ ,} \qquad (6)$$

where $N_b$ is the base wage normative taking into account the organizational-technical level of production, as well as the wage level of the base year (the last year of the preplanning period);

$K_n = \frac{V_n}{P_n}$ is a coefficient of reduction in the wage normative, correspondingly, for the n-th year of the five-year plan (n=1, 2, 3, 4, 5), $V_n$ and $P_n$ are, correspondingly, the rates of wage growth and labor productivity in the n-th year of the five-year plan as compared with the base year.

Examples of dynamic normatives of wages by year of the five-year plan are given in Tables 2 and 3.

Table 2. Example of Wage Normatives Per Rubles of Construction-Installation Work in 1981-1985

| indicators | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|
| rate of labor productivity growth, in percent | 100 | 102.86 | 105.8 | 108.83 | 111.94 | 115.14 |
| rate of wage growth, in percent | 100 | 101.48 | 102.98 | 104.5 | 106.05 | 107.62 |
| coefficient of reduction in wage expenditures per ruble of construction-installation work | 1 | 0.9866 | 0.9733 | 0.9602 | 0.9474 | 0.9347 |
| wage normatives per ruble of construction-installation work | 19.21 | 18.95 | 18.7 | 18.45 | 18.2 | 17.96 |

Table 3. Planned Wage Normatives Per 1,000 $m^2$ of Total Housing Space for 1981-1985*

| house series | normative base level | normatives by year of the five-year plan, in rubles<br>1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|
| A | 3,546 | 3,502 | 3,459 | 3,416 | 3,374 | 3,332 |
| B | 5,487 | 5,419 | 5,352 | 5,285 | 5,220 | 5,155 |
| C | 6,018 | 5,943 | 5,869 | 5,797 | 5,725 | 5,654 |
| D | 5,362 | 5,296 | 5,230 | 5,165 | 5,102 | 5,038 |

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*1981=1985 rates of labor productivity growth and wages are assumed to be 115 and 108 percent, respectively.

Perfecting methods of limiting wage funds and monitoring their expenditure is a special, complex problem.

At present, the existing procedure for limiting the wage fund is not linked to the planned indicators of commodity construction output. The goal of carrying out plans in terms of commodity output (one of the main indicators for evaluating construction organization activity) is in conflict with construction organization incentives to have the necessary wage fund for the entire amount of work being done, including unfinished production.

The hopes placed on using normative conventional net output in this connection are, we think, hardly justified. The fact is that the amount of work done as measured in normative conventional net output will not be confirmed by the client, and monitoring the reliability of its determination and consequently the wage fund expenditure will be very difficult.

It would probably be appropriate to monitor wage fund expenditure according to volume of work done in terms of commodity output, as well as with consideration of the volume of unfinished production. To do this, we need to differentiate wage normatives and establish them: a) per ruble of commodity construction output volume and b) per ruble of amount of unfinished construction production. In this regard, normatives for unfinished production must be set in lower amounts than normatives for commodity output (by 15-20 percent, based on preliminary calculations). The wage fund could be determined for work volume done as follows. When the commodity construction output volume plan is fulfilled or overfulfilled, the wage fund is set on the basis of differentiated normatives for amount of commodity construction output actually done, plus (or minus) the actual amount of increment (decrement) in unfinished production.

If the plan is underfulfilled in terms of commodity construction output, the wage fund is set as the actual amount of commodity construction output actually done, plus (or minus) the planned amount of increment (decrement) in unfinished production.

Such a procedure for planning and monitoring wage fund expenditure could expediently be verified experimentally in a number of construction organizations with different specialties.

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# CONSTRUCTION

## FINANCIAL AND CREDIT LEVERS IN CAPITAL CONSTRUCTION

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[Article by Candidate of Economic Sciences S. Chernetsov: "Finance and Credit in Capital Construction"]

[Text] Under mature socialism, the financial-credit mechanism is undergoing further development and improvement; the importance of finances and credit in the reproduction of fixed production assets is growing. This process was reflected in the CPSU Central Committee and USSR Council of Ministers Decree "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Improving Production Efficiency and Work Quality," adopted 12 July 1979, in which, in particular, a system of measures to further improve planned leadership of capital construction is set forth. The actualization of measures outlined in the indicated decree, which has already begun, must ensure effective implementation of the broad capital construction program adopted by the 26th CPSU Congress for the 11th Five-Year Plan and through 1989. We are faced with the task of achieving a major advance in increasing capital investment effectiveness and ensuring the increase in national income outlined for the five-year plan with a smaller absolute and relative increment in capital investments than in the preceding five years.[1]

Financial-credit levers must play an important role in resolving this task.

### New Procedure for Financing Capital Investments

Under present conditions, enterprise (production association) own funds are one of the main sources of financing for capital investments. We have in mind foremost that portion of profit placed at enterprise disposal.

Moreover, some depreciation funds are used to finance capital investments: 10-50 percent of the deductions intended for full renovation of fixed assets are directed into the production development funds of production associations (enterprises) in accordance with the established normatives, and the remainder is used in the production associations (enterprises), all-union (republic) industrial associations, ministries and departments, foremost for the retooling and renovation of existing enterprises in accordance with capital construction plans. Other sources of capital investment financing mobilized by enterprises include revenues from the marketing of by-product mineral extraction (obtained in the construction process) receipts from the sale of worn-out property and other material values (related to fixed capital), planned profit and savings from reduced construction-installation net cost, depreciation deductions when the cost-accounting method of construction is used, and a number of others. Given a shortage of own funds for financing capital investment, the possibility of using bank credit and state budget funds is outlined for production-type projects.

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[1] See: Tikhonov, N. A., "Basic Directions of USSR Economic and Social Development in 1981-1985 and up to 1990. Report at the 26th CPSU Congress on 27 February 1981," PRAVDA, 28 February 1981, p 3.

Long-term credit is granted for planned state capital investments to retool, renovate and expand existing enterprises, planning for future construction, building housing and cultural or personal-services projects if there are insufficient funds in the social and cultural measures and housing construction fund. Planned state capital investments on building new enterprises, and in particular, enterprises and projects being put up on the basis of compensatory agreements and contracts with companies in capitalist countries, are made wholly through credit. Enterprises released to clients as "turnkey" finished projects are built by contractor organizations entirely through credit amounting to the full cost of construction. Long-term credit is also granted for above-plan state capital investments ensuring highly effective measures to release new products and improve the quality of items in production, to expand the production of consumer goods and improve personal services to the population.

Structural changes in sources of state capital investment financing over the last three five-year plans are described by the data of the table.

Sources of State Capital Investment Financing (on average per five-year period, in percent of the total)

| years | budgeted funds | own funds | long-term credit |
|---|---|---|---|
| 1966-1970 | 52.6 | 46.2 | 1.2 |
| 1970-1975 | 48.2 | 47.7 | 4.1 |
| 1976-1980 | 43.2 | 49.5 | 7.3 |

It is evident from the table that nearly 60 percent of the expenditures on capital construction are covered from the funds of enterprises, organizations and ministries themselves and through long-term bank credit. As a result, increasing production capacity and fixed assets in the nonproduction sphere depends increasingly on the results of the economic and financial activity of the enterprises, associations, ministries and departments. Changes in the structure of sources of capital investment financing reflect the development of cost-accounting relations, the transformation of functions and tasks performed by the budget, and the overall enhancement of the role of economic factors in the management of capital construction.

Stable five-year capital construction plans broken down by year are approved for USSR ministries and departments and union republic councils of ministers now. The construction volumes outlined in the plans must be fully provided with labor and financial resources, as well as with construction-installation organization capacities. A capital investment limit (not volume, as previously) is now approved for clients in the five-year plans, that is, a limit is set on capital expenditures for the planned start-up of enterprises, capacities and projects. This procedure must help us save planned capital investment expenditures and adhere to the estimated costs of construction.

We are introducing the principle of continuous production project construction financing. It is based on a heightened role for the titles list, which must be a planning document which remains unchanged throughout the entire construction period and which is binding on both the client and contractor and on financial and banking agencies and on suppliers of equipment and components. Changes can be made in titles lists only when plans are reviewed in connection with the use of improved equipment or more progressive technology. The work volumes outlined in the titles list for the next year are not reviewed. The CPSU Contral Committee and USSR Council of Ministers decree of 12 July 1979 institutes benefits in financing projects whose construction is completed ahead of schedule. When the capital construction plan for the current year is overfulfilled, production construction projects are financed through credit. The same applies to financing large technological and power equipment manufactured domestically. Credit is granted clients up to the planned, scheduled release of equipment for installation. When schedules for using loans are not followed, higher interest is charged.

## Calculations for Finished Construction Output

Orienting construction organization activity towards accelerating the start-up of production capacities and projects has required substantial changes in the system of construction calculations and the institution of new forms of such calculations:[1] calculations for finished, marketable construction output; for projects released on a "turnkey" basis; for supplying and installing complete sets of equipment.

In 1981, we anticipate completing the introduction of calculations between client and contractor for completely finished construction and enterprises, start-up complexes, lines and projects released for operation and ready to produce output or render services, based on estimated cost of commodity construction output. With the changeover to this calculation procedure, the expenditures of contractor organizations on unfinished production must be covered through bank credits, using for these purposes funds freed by clients. Upon expiration of the planned schedule for releasing enterprises, start-up complexes, lines and projects, credit is continued at higher interest rates for use of the loans (four percent, instead of the 0.5 percent prior to planned date of release). Calculations between contractors and clients are based on full estimated cost of work and expenditures set in the approved estimate after the project has been accepted for operation based on a state commission document which has then been approved. Any savings achieved by the contractor as against the estimate remains at his disposal. When projection capacities and projects are put into operation ahead of schedule, 50 percent of the planned profit obtained during the additional time is placed at the disposal of the contractor.

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[1] It is known that a system of calculating based on percentage of technical readiness and for individual stages has long been in effect in capital construction. The following data for 1978 provide an idea of the relationship of forms of calculations for construction output: calculations for completely finished construction-installation work, by project -- 60 percent; for three stages (below-grade cycle, building, equipment installation) -- 5.2 percent; for four or more stages -- 26.3 percent; by percentage of readiness -- 2.5 percent (see: Podshivalenko, P., "Strengthening the Role of Financial-Credit Levers to Improve Capital Investment Effectiveness," VOPROSY EKONOMIKI, No 4, 1980, p 66).

At present, contractor organizations of the USSR Ministry of Construction which perform 52 percent of the ministry's annual work volume have been transferred to the new form of calculations, as have organizations of the USSR Ministry of Construction of Heavy Industry Enterprises which perform 41.5 percent of its work. This transfer is complete for contractor organizations of the Glavmosinzhstroy, Glavkiyevgorstroy, Glavbakstroy and USSR Ministry of Construction of Petroleum and Gas Industry Enterprises.

For certain special types of construction, especially ones with a long cycle (in particular, hydraulic engineering, reclamation, pipeline and road), it is appropriate to introduce "turnkey" calculations. Experiments run by the USSR Stroybank have confirmed the effectiveness and appropriateness of this progressive method of interrelationships in capital construction. However, whereas "turnkey" payments comprised two-thirds of the paid work in housing and civil construction in 1979, the proportion of such payments in production construction was insignificant.[1] This situation must be corrected in the course of carrying out the current complex of measures to improve the economic mechanism.

One direction in which the effectiveness of capital investment use is being improved is the gradual transition of individual branches to building enterprises (installations) using credit granted by the USSR Stroybank to contractor construction-installation organizations in an amount equal to the full cost of construction for the enterprise (installation) as determined by the estimate accepted by the general contractor, with the finished enterprises (installations) being released to clients on a "turnkey" basis. This credit is issued for the planned construction period. Upon its expiration, the crediting is continued at higher interest rates. "Turnkey" construction signifies that, along with performing construction-installation work, the contractor also implements job authorizations for equipment, items and materials which are allocated the client, with whose consent he can assume the task of providing the project with designs, estimates and blueprints on the basis of an agreement with the appropriate planning organization. The contractor checks the completeness of in-coming equipment and is responsible for its acceptance and protection from the time it arrives at the warehouse until release to the client for start-up and adjustment work and complete testing.

During the construction of the enterprises (installations), clients transfer the means of financing anticipated by the plan into special accounts on the basis of the amount of expenditures made by the general contractor, including the cost of equipment paid for by him and other capital expenditures and work. The transferred funds are resources for crediting contractor organization unfinished construction.

Calculations are made between client and contractor only for enterprises released for operation and ready to produce output or render service. Documents accepting such enterprises for operation must be approved by agencies designated by state acceptance commissions. After a finished enterprise is accepted for operation, the general contractor submits to the client for payment an estimated-payment demand for the full cost anticipated in the agreement. Funds received from clients for completely finished enterprise construction are used to pay off loans and to meet expenditures on unfinished construction, and the remainder is put in the general contractor's current account. When enterprises are put into operation ahead of schedule, the bank grants the client credit, if the necessity arises, for expenditures connected with overfulfilling the capital investment plan. Such credit is paid off not later than the planned, scheduled start-up of the enterprise.

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[1] See: "Sovershenstvovaniye khozyaystvennogo mekhanizma" [Perfecting the Economic Mechanism], Moscow, 1980, p 180.

"Turnkey" calculations are the most effective form of financial-credit interrelationships in construction. They facilitate strengthening the economic stimulation of contractor organizations to reduce construction duration and to meet assignments on putting production capacities, projects and fixed assets into operation on or ahead of schedule.

Improving the system of calculations in construction also anticipates a change-over to calculations between clients and design-surveying organizations for completely finished, accepted documentation. Design organization expenditures before the planned, scheduled release of the designs are covered through own circulating capital and bank credit. All design-surveying organizations are transferred to the new form of calculations as of 1 January 1981.

## Increasing Role of Bank Credits in Construction

Whereas in 1966 centralized capital investments accounted for 8.1 percent of long-term loans issued by the USSR Stroybank, in 1979 that figure was more than 95 percent. Credit has emerged as one of the basic sources of development of those branches of industry which determine the tempo of technical progress. Thus, the proportion of credit in financing sources has been from 13.8 to 37.7 percent for machine building ministries and from 33.6 to 47.9 percent for the USSR Ministry of Chemical Industry, Ministry of Food Industry and Ministry of Petrochemical Industry. The share of credit in expenditures on retooling and renovating existing enterprises exceeds 30 percent. In building enterprises at which expenditures are recompensed in up to five years, credit accounts for up to 90 percent of all financing, for compensatory construction projects -- nearly 100 percent, in building enterprises producing consumer goods and at cultural and personal-services projects -- more than 40 percent, in cooperative housing construction -- upwards of 50 percent, and in building projects and making expenditures permitted in addition to the state plan -- about 80 percent.

The advantages of the credit method of financing expanded reproduction of fixed assets consist first in that the state ensures, through bank credit, that capital investments will have the needed resources in accordance with national economic development plans. In this regard, credit is a stable, guaranteed source of funds. Second, providing credit for capital investments increases the responsibility of enterprise leaders for the intelligent use of funds, for putting fixed assets into operation promptly, utilizing new capacities and accelerating the reimbursement of capital expenditures. At the same time, credit helps broaden the rights of enterprise leaders to spend funds to introduce new equipment and develop initiative in expanding and improving production. Third, granting credit, given substantiation for a higher (not less than normative) effectiveness of expenditures than planned, assured reimbursement and return of funds within the established schedules and payment of interest, helps increase the effectiveness of expenditures. Fourth, credit allows the bank considerably broader opportunities for using various economic methods to stimulate and monitor the effectiveness of capital investments. Fifth, the direct participation of credit in the circulation of fixed assets permits use of its principles (term, return, targeting) to link economic results of enterprise activity with the effectiveness of investments in fixed assets.

Differentiated interest rates, aimed at increasing the material responsibility of enterprises, associations and organizations in making calculations promptly in the national economy, play an important role in the effectiveness of credit use.

Strengthening the role of credit as a source of expanded reproduction of fixed assets creates a basis for more actively influencing labor productivity growth in construction, reducing construction time and amounts of unfinished construction production, lowering construction cost, improving construction output quality, and perfecting the financial-economic activity of contractor organizations.

## Planning Construction-Installation Organization Work and Profitability

The intensive path of running construction production requires that all the economic and financial activity of construction-installation organizations be oriented towards end results, that is, towards putting capacities and projects into operation. Until recently, evaluating construction organization activity, allocating them material resources and circulating capital, establishing the wage fund and organizing the bonus system were in practice basically oriented towards indicators of total construction-installation work volume, in spite of the fact that the indicator of commodity construction output has been approved, along with assignments for putting capacities and projects into operation, for construction-installation organizations, beginning in 1969. The economic point was that that indicator represents the estimated cost of construction-installation work done by project and stage according to plan since the start of construction and subject to release to the client. However, it first of all operated "on a par" with a number of other indicators and, second, it was not set at the ministry level, which naturally reduced its effectiveness.

In the 11th Five-Year Plan, two most important indicators of construction production are being approved in the five-year plans (with a break-down of assignments by year) for all USSR ministries and departments, union republic councils of ministers and subordinate organizations: start-up of production capacities and projects, including increment in capacity through retooling and renovating existing enterprises; commodity construction output volume -- total, and that done by one's own efforts (with the total volume being distributed among clients). Assignments on starting up capacities and projects are now also being set for organizations installing basic technological and power equipment, on which ensuring the prompt start-up of capacities and utilization of the design indicators of future enterprises largely depends. To correlate the cost-volume indicators of contractor organizations and clients, superior organizations are also setting the latter a commodity construction output plan, and in so doing are ensuring a communality of interests among clients and contractors.

Assignments on labor productivity growth, ceilings on numbers of workers and employees, total wage fund, profit (and on reducing construction-installation work net cost, for individual organizations), introducing new equipment, and deliveries of materials, machines, machinery and other material-technical resources, are also approved in the five-year and annual plans for construction production.

The new system of evaluation indicators is also of important significance to builders. Heretofore, it has been oriented towards fulfillment of the capital investment plan, that is, essentially towards the expenditure of funds. Capital investment plans were fulfilled, funds were "utilized," but the start-ups lagged significantly behind the plan (by 20-30 percent or more in certain branches). The orientation towards gross indicators led to increased interest among construction-installation organizations in using more expensive materials and components, to dividing projects into "profitable" and "unprofitable." These flaws have been eliminated in the current procedure, in which the economic activity of construction-installation organizations is evaluated and they are economically stimulated as a function of their fulfillment of assignments on putting production capacities and projects into operation, commodity construction output, labor productivity growth and profit. The main thing now is to release finished projects. In this regard, the less material resources and manpower is used, the higher construction organization profit will be and the better the evaluation of it will be, so the greater deductions to economic incentives funds will be.

In 1979, the absolute profit obtained by contractor construction organizations totalled 7.759 million rubles, as against 1.605 million rubles in 1965, an increase of 4.8-fold, given a two-fold increase in the volume of contractor work during this period.[1] This is to be explained by improvement in the quality of the work and, foremost, by labor productivity growth in contractor organizations. In 1979, labor productivity in construction had improved 41 percent as compared with 1970, and the index of actual construction-installation work net cost was 99.6.[2] The level of profitability of construction contractor organizations (profit from the release of work to clients as a percentage of contractor construction work net cost) was 12.5 percent in 1979 as against 11.3 percent in 1970 and 6.1 percent in 1965. At the same time, from 1976 through 1979 profitability dropped 2.6 points for contractor organizations as a whole. Nearly 40 percent of the primary construction-installation organizations failed to meet profit accumulation plans and more than 25 percent of these operated at a loss. In sum, the branch failed to provide the national economy with 400-500 million rubles in profit each year as compared with the plan.[3]

The most important reasons for failure to carry out contractor organization accumulation plans is the failure to meet plan assignments for releasing finished construction output to clients, for labor productivity growth, and the diverting of funds into above-plan amounts of unfinished construction production and commodity-material values reserves, as well as calculations with clients indicating that work has been done for projects released with unfinished work. The primary directions in which things are being improved in capital construction and the profitability of contractor organizations will be improved in the 11th Five-Year Plan are: ensuring the prompt start-up of fixed assets and production capacities, reducing construction time, bringing the amount of unfinished construction and stocks of uninstalled equipment down to the normatives, labor productivity growth and lowering the net cost of construction-installation work. Their implementation, as is outlined in the "Basic

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[1] See: "Narodnoye khozyaystvo SSSR v 1979 g." [USSR National Economy in 1979], Moscow, 1980, pp 539, 374.

[2] See: Op. cit., pp 381, 382.

[3] See: Podshivalenko, P., "Strengthening the Role of Financial-Credit Levers in Increasing Capital Investment Effectiveness," VOPROSY EKONOMIKI, No 4, 1980, p 71.

Directions of USSR Economic and Social Development in 1981-1985 and up to 1990," assumes improvement in construction production; development of progressive forms of construction organization -- block-set, special effort ["vakhtovaya"], junction; universal dissemination of the internal process brigade contract based on raising the level of engineering preparation and production-technological use of complete sets;[1] steps to reduce expenditures of manual labor, equip construction organizations with highly productive machines and use them better, thanks to higher shift indexes. We also need to raise the level of construction production industrialization and the degree of factory readiness of construction components and parts and to make broader use of efficient new materials.[2]

Improving the cost-accounting methods of construction organization work is associated with choosing the most effective forms and principles of distributing profit, with the use of established, long-term, stable normatives by year of the five-year plan.

The development of cost accounting in construction-installation organizations guaranteed an increase in resources left at their disposal as a function of improvement in the end results of economic activity, with simultaneous growth in deductions of funds to the state budget. In construction organizations, economic incentives funds, material encouragement funds, funds for social and cultural measures and housing construction and production development funds are generated through deductions from profit and other sources. The generation of these funds must be based on stable normatives approved in differentiated amounts by year of the five-year plan, through the direct deduction of funds from total profit obtained from releasing finished construction output to clients, as a function of labor productivity growth. The indicated funds must be used strictly for their targeted purposes. Unused carry-over funds are transferred to the next year and are not withdrawn.

In order to increase the material interest of construction organizations in starting up production capacities and projects within the planned schedules, the size of bonuses for their prompt start-up has been increased to an average of three percent (instead of two) of the estimated cost of construction-installation work done on capacities and projects put into operation. The bonus for starting up projects on schedule is paid with consideration of work quality: it is increased 10 percent for an evaluation of "excellent," does not increase for an evaluation of "good," and is reduced by 20 percent for an evaluation of "satisfactory."

When contractor organizations put production capacities into operation ahead of schedule as against the approved norms, the general contractor receives from the client funds amounting to 50 percent of the profit anticipated by the design for that period by which construction time has been reduced, but these funds cannot exceed five percent of the estimated cost of construction-installation work for each month of reduction in construction time. The indicated funds are directed into the economic incentives funds of organizations participating in the construction.

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[1] About 75,000 brigades, or 36.5 percent of the total number, are working on brigade contracts. Thirty percent of all construction-installation work is done using this progressive method. Use of the brigade contract facilitates reducing project construction time by 17-20 percent, improving labor productivity 20-25 percent and achieving a savings of 3-4 percent (as compared with the calculated cost of the work done).

[2] See: PRAVDA, 5 March 1981, p 5.

The better use of financial-credit levers must become a most important means of resolving the task set by the 26th CPSU Congress of improving capital investment effectiveness, of "actualizing the directives of the party Central Committee and the instructions of Leonid Il'ich Brezhnev on resolutely fighting against scattering capital investments, on concentrating them in the most important sectors of industrial and agricultural production, start-up construction projects, and reducing the time involved in putting up new projects."[1]

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[1] Tikhonov, N. A., "Basic Directions of USSR Economic and Social Development in 1981-1985 and up to 1990. Report at the 26th CPSU Congress on 27 February 1981," PRAVDA, 28 February 1981, p 3.

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# USSR MINISTER OF RURAL CONSTRUCTION DISCUSSES TASKS FOR FIVE-YEAR PLAN

Moscow EKONOMIKA STROITEL'STVA in Russian No 7, Jul 81 (signed to press 30 Jun 81) pp 3-7

[Article by S.D. Khitrov, USSR Minister of Rural Construction: "Five-Year Plan of Rural Builders"]

[Text] As pointed out in the decisions handed down during the 26th CPSU Congress, during the 1980's the communist party will persistently continue to implement its economic strategy, the principal goal of which is that of achieving steady improvements in the material and cultural standard of living for the people, creating the best conditions for comprehensive development of individuals based upon further improvements in the efficiency of all social production and increasing labor productivity and growth in the social and labor activities of Soviet people.

The rural builders are making their own contribution in carrying out the decisions of the party congress. The question as to how well they will perform is dependent to a definite degree upon the fulfillment of the tasks confronting agriculture.

Today the USSR Minsel'stroy [Ministry of Rural Construction] system consists of a network of state and, in a number of republics, of interenterprise construction organizations engaged in carrying out construction-installation work, using the contractual method, on almost the entire territory of the country. At the present time, there are in operation approximately 300 associations, agricultural production administrations and construction-installation trusts, in excess of 3,400 primary construction organizations (mainly mobile subunits -- mobile mechanized columns), more than 500 industrial enterprises, including 47 rural housing construction combines. Specialized trusts have been created for installation and special construction work. There are more than 1 million individuals working within the ministry's system.

The rural builders must carry out a great amount of work during the Eleventh Five-Year Plan. The USSR Minsel'stroy must carry out the principal portion of the work associated with further developing the milling-groats and mixed feed industry, where the plans call for the production of high grade flour to be increased by 24-27 percent, mixed feed -- by 13-15 percent, to place in operation grain elevators having considerable capacities -- mainly in the principal grain regions, to increase the grain drying capabilities in the regions in which sunflowers, corn and rice are grown and to erect animal husbandry complexes of the industrial type, poultry factories, hothouses and installations of the light and food industry. A considerable portion of the ministry's program is concerned with the construction of dwellings, childrens' pre-school institutes and projects of a cultural-domestic and communal nature.

The organizations of the ministry must carry out a great volume of work in the nonchernozem zone of the RSFSR. In this zone, in conformity with the decisions handed down during the 26th CPSU Congress, work will continue aimed at implementing an all-round program for transforming the zone into a region of highly productive farming and animal husbandry and for developing their associated branches of industry. The construction of housing and projects of a socio-cultural and communal-domestic nature will be accelerated here. During the Eleventh Five-Year Plan, the organizations of the ministry must build in the nonchernzem zone 1.5 times more housing and 22,300 more kindergarten billets than during the Tenth Five-Year Plan. Agricultural production construction work must also be carried out at a high tempo.

The organizations of the ministry also have a great amount of work to carry out in the central-chernozem zone of the RSFSR. Here a requirement exists for building agricultural production installations, workshops, garages, stations for the technical servicing of agricultural machines, storehouses and facilities for fertilizers and toxic chemicals. A considerable increase must take place in the volumes of housing and cultural-domestic construction.

Solutions can be achieved for these important tasks only by sharply raising the efficiency of construction production and the quality of work. A complex of measures aimed at accomplishing this is set forth in a decree of the CC CPSU and USSR Council of Ministers, concerned with improving the economic mechanism.

One such measure is that of converting over to planning and evaluating the work based upon marketable construction output. In 1980, 58 construction organizations were converted over to planning and evaluating work based upon marketable construction output and to maintaining accounts with customers for enterprises, start-up complexes, phases and projects which have been placed in operation following the completion of construction work, in accordance with the estimated value of the marketable construction output. These organizations carried out 31 percent of the ministry's volume of contractual work. At many of them, improvements were realized in the technical-economic indicators of their activities.

In 1981, all of the ministry's construction organizations must convert over to planning and evaluating their work based upon marketable construction output and to maintaining accounts with customers for projects that have been fully completed and placed in operation.

However, experience has shown that this work has not reached the proper level in all areas. For example, a number of republic rural construction ministries have provided their subordinate organizations with sharply lowered volumes for marketable construction output for the 1st quarter of 1981.

The practice of shifting the construction program underway to the second half of the year, especially to the 4th quarter, is being repeated. This is fraught with the danger of disrupting the placing in operation of a number of projects and it leads to unjustified expenditures and to low quality construction work.

The problem must be corrected by including in the work of planning the marketable construction output, all services of the construction organizations, including the production and technical services. The ministers and leaders of the construction organizations must exercise constant control over this work.

During the years of the Tenth Five-Year Plan, labor productivity for the ministry on the whole increased only 5 percent in construction and 3.3 percent in industry. The established task for raising labor productivity in construction was fulfilled only by Minsel'stroy for the GSSR and Minsel'stroy for the ArSSR and in industry -- only by Minsel'stroy for the ArSSR. In a number of union republic rural construction ministries, labor productivity decreased by 4-5 points during the years of the five-year plan compared to the 1975 level. In construction, this applies to the minsel'stroy organizations for the KaSSR, MSSR, KiSSR, TaSSR and TuSSR and in industry -- to the minsel'stroy organizations for the MSSR and the KiSSR.

This results from the fact that proper attention is not being given in all areas to those problems concerned with improving production organization and technology, raising the level of industrialization and mechanization of construction, improving the utilization of available construction machines and light mechanization equipment and improving the organization of labor for workers.

Meanwhile, examples of highly productive labor are to be found in many areas. Within the ministry's system, highly productive work is presently being performed by 25 cost accounting brigades. On the whole, these brigades are carrying out 1 million or more rubles worth of work annually on projects, stages or technological complexes. The number of workers in such brigades ranges from 25 to 100 or more.

For example, there are 54 individuals assigned to the complex cost accounting brigade headed by Hero of Socialist Labor and honored builder of the RSFSR P.T. Baranov, of PMK [mobile mechanized column] -1046, Rostsel'stroy Administration of the RSFSR Minsel'stroy. This brigade, by carrying out more than 1 million rubles worth of construction-installation work annually, completed its 5-year plan in just 4 years. During the Tenth Five-Year Plan, it built and placed in operation, with an evaluation of very good, 12 poultry houses at the Priazovskoye Poultry Factory, a breeding-reproducer, a boarding house at an SPTU [agricultural professional-technical school], dwellings at Azov and Bataysk and other projects.

The brigade has as its slogan -- "For each day -- highly productive labor." The annual output per worker is 20,500 rubles. The production tasks are being fulfilled systematically by 148-150 percent.

At PMK-3 of Construction Trust No. 23 for Minsel'stroy of the UzSSR, fine work is being performed by the complex cost accounting brigade of A.A. Vedel'. It consists of 51 workers. The annual volume of work carried out by them is in excess of 1 million rubles and during the five-year plan the brigade carried out 6.3 million rubles worth of construction-installation work. Many facilities were built and placed in operation: dwellings providing 30,152 square meters of living space, clubs for 675 billets, a fruit storehouse for 1,000 tons, a post office in the settlement of Kirbay, a dining hall for 110 people and a music school for 250 pupils. In 1980, the output for one brick masonry worker in the brigade was 2.4 cubic meters per shift, compared to a norm of 1.2 cubic meters. From a monetary standpoint, the annual output was 1.4 times greater than the average for the PMK.

The communist labor brigade PDSP No. 5 of the Severelevatormel'stroy Trust of Minsel'stroy for the KaSSR, headed by S.A. Lazarev, consists of 35 workers and in 1980 it carried out 1.4 million rubles worth of construction-installation work. The output per member of the brigade reached 40,200 rubles, or 125 percent of the plan and the real output for the installation of precast reinforced concrete -- 3.3 cubic meters compared to a norm of 2.5 cubic meters. All of the projects are turned over for operation ahead of schedule and with evaluations of very good or excellent.

What is the secret of this success? First of all, these brigades are distinguished by fine labor organization. They employ light mechanization equipment, highly productive instruments and various devices in a skilled manner and the workers have mastered 2-3 allied professions. Many of the brigades include tower crane operators, motor vehicle drivers and duty machinists and electricians. This makes it possible to raise their interest in achieving more efficient use of the equipment. As a result, full employment of the workers is ensured and losses in working time are reduced to a minimum. As a rule, the collectives of such brigades are stable.

We must not overlook the fact that the task also consists of ensuring that their achievements are made available to a broad range of workers. The advocates of new developments and specialists attached to the higher elements of an administration or ministry must energetically ensure that the best experience is disseminated on an extensive scale. Greater demands must be placed upon each engineer: what is he doing specifically to increase the labor productivity of workers?

During the years of the Tenth Five-Year Plan, work was carried out in connection with the technical re-equipping of the construction organizations, by providing them with new and highly productive machines and mechanisms.

The ministry's construction organizations are annually obtaining from the state a considerable number of road construction machines, mechanisms, devices and instruments. In addition, 40 million rubles worth of new machines, light mechanization equipment and devices, produced at plants of USSR Minsel'stroy, are being supplied to them.

In 1980, the average annual balance value for construction equipment exceeded 900 million rubles and, compared to 1976, it had increased by 25 percent. In the process, the machine-worker ratio in construction increased from 16.5 to 20 percent. However, according to the data obtained from inspections carried out in 1980, the intra-shift losses in the working time of machines continue to remain considerable. Thus, such losses amounted to 20 percent at Minsel'stroy for the UkSSR and at Minsel'stroy for the KaSSR.

During the years of the Tenth Five-Year Plan, the work regime for the principal construction machines and motor vehicles improved slightly and now amounts to 8-10 hours daily. A decrease took place in the daily duration of operation of the principal machines in a number of organizations of minsel'stroy's for the RSFSR, KaSSR, AzSSR and the TuSSR.

In mobilizing the reserves for accelerating growth in labor productivity in rural construction, special attention must be given to the problem of mechanization. It must produce an appropriate return. And towards this end, the demand should be raised fully.

The leaders of the republic ministries and economic services must devote special attention to the efficient use of the fixed productive capital. The average annual value of the fixed capital increased from 1.72 billion rubles in 1975 to 2.37 billion rubles in 1979 and its yield during this period decreased. This is a serious shortcoming and one which lowers operational efficiency. An efficient program for improving the indicator for capital-output ratio must be made available in all areas.

Under conditions involving dispersed construction operations, the most suitable organizational form is that of SSK's [sel'skiy stroitel'nyy kombinat; rural construction combine]. A great and very important problem confronting the ministry is that of expanding the work volumes being carried out by the rural construction and house-building combines. A considerable number of such combines are already in operation and their network will be steadily expanded.

Not all of the operating combines are performing in the same fine manner. In the minsel'stroy's for the UzSSR, GSSR, AzSSR, TaSSR and TuSSR, not enough work is being carried out in connection with making preparations for creating rural construction combines.

An SSK must be a monolithic industrial-construction complex in which independence and the rights and responsibilities of an economic leader are expanded. In this complex, all of the elements must be oriented towards the main task -- to placing projects in operation with minimal expenditures and production expenses.

This is a very vital task at a given stage.

Within the ministry, a great amount of attention is being given to those problems concerned with raising the technical level of rural construction. The results of this concern are readily at hand. Almost all of the rural production buildings of major concern and the elevators are being built using precast structures. One third of the dwellings are being erected using large-scale panels and units. The level of mechanization of labor-consuming operations has been raised.

However, in order to solve the tasks confronting the rural builders during the Eleventh Five-Year Plan, a new approach will be required for raising the technical level of construction. The problem consists not only of employing industrial work methods on a more extensive scale, but mainly of giving new meaning to these methods and raising their efficiency.

Thus, an increase in the volumes of construction of completely prefabricated rural production buildings, in the form in which they are being erected today, is still not producing adequate results. Qualitative improvements are required in the solutions being employed, the level of plant readiness for all elements of buildings must be raised, they must be enlarged and connecting methods must be introduced which will ensure highly accurate and reliable installation work, together with reduced labor expenditures. Such work has already commenced. Every attempt should be made to ensure that new and progressive solutions, once they have been checked, are introduced into operational practice on an extensive scale and as rapidly as possible.

The construction of completely prefabricated projects, even those which are extremely diverse in nature, must be carried out using a minimal set of industrial items and structures. Here emphasis must be placed upon the need for maximum plant readiness for each item in the minimal set.

In solving these tasks, the role and responsibility not only of the respective services of USSR Minsel'stroy but also the planning organizations of USSR Minsel'khoz [Ministry of Agriculture] are great indeed. The planning economy must be placed in order. The chief result of this work must be the removal from use, as rapidly as possible, of obsolete standard plans and their replacement by new and more improved planning solutions. These latter solutions should call for the use of a minimal nomenclature of items of high plant readiness and a sharp reduction in labor expenditures at the rural construction sites.

During the Eleventh Five-Year Plan, in conformity with the decisions handed down during the 26th party congress, the volume of civil housing construction in the rural areas will increase. At the same time, the industrialization of this type of construction within the ministry is still lagging behind. Thus the Eleventh Five-Year Plan must become a five-year plan devoted to raising the level of prefabrication and the quality of erection of housing and public buildings. There is a powerful production base available for this purpose within the ministry's system and it is the task of the rural builders to ensure that it is utilized in an efficient manner.

The rural builders, similar to all Soviet people, welcomed the decisions handed down during the 26th CPSU Congress, decisions which became a militant program for action. In 1981, the ministry must place in operation a considerable number of projects and capabilities and fulfill a plan for marketable construction output in the amount of 6.3 billion rubles.

An all-union socialist competition for the successful fulfillment and overfulfillment of the planned tasks for 1981 was initiated by the following: the collectives of the Order of the "Badge of Honor" Mariyskiy Construction Trust imeni 50-Letiya SSSR, the Sverdlovskoblsel'stroy Administration and the Kalinin Experimental Rural Housing Construction Combine of the Kalininsel'stroy Administration of RSFSR Minsel'stroy, the Ukrsel'energomontazh Trust of Minsel'stroy for the UkSSR, the Mozyr'sel'stroy Trust of Minsel'stroy for the BSSR, Construction Trust No. 11 of Minsel'stroy for the UzSSR, Kokchetavsel'stroy Trust No. 17 of Minsel'stroy for the KzSSR, the Panevezhis Motor Transport Enterprise No. 4 of Minsel'stroy for the LiSSR, SPMK No. 101 of Minsel'stroy for the MSSR, Stroytrest No. 6 of Minsel'stroy for the ArSSR, complex cost accounting brigades of the honored RSFSR builder V.A. Marchenko (Sevkavelevatorstroy), P.T. Baranov (Rostsel'stroy Administration), I.M. Ivanets (Borispol'sel'stroy Trust), Hero of

Socialist Labor D.S. Bagdavadze (Trust No. 2 of Minsel'stroy for the GSSR, A.G. Ipatova (Rural Construction Production Administration No. 1 of Minsel'stroy for the MSSR.

Having launched the socialist competition and by improving its form, relying upon publicity, a comparison of results and the dissemination of leading experience, the rural builders are directing their efforts towards the successful fulfillment of the tasks for the Eleventh Five-Year Plan.

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## MECHANIZING CONSTRUCTION IN THE 11TH FIVE-YEAR PLAN

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 8, Aug 81 (signed to press 8 Jul 81) pp 2-3

[Article by N.V. Goldin, Minister of Construction of Heavy Industry Enterprises for the USSR: "In Accordance With Special Purpose All-Round Programs"]

[Text] The builders of USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises], similar to all Soviet people, are inspired by the decisions handed down during the 26th CPSU Congress and thus they are celebrating their professional holiday with new labor successes and they are fully resolved to fulfill the tasks established by the congress in the sphere of capital construction.

In the Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990, adopted during the 26th CPSU Congress, emphasis is placed upon the need for raising labor productivity in construction by 15-17 percent. This requires the implementation of measures aimed at reducing manual labor expenditures considerably, supplying the construction organizations with highly productive machines, light mechanization equipment and mechanized and manual instruments and making more complete use of them through improved shift operations.

During the years of the Tenth Five-Year Plan, the ministry's construction organizations placed in operation more than 1,200 projects of a production nature. Fifty five million square meters of dwelling space and a large number of schools, childrens' pre-school institutes, hospitals and polyclinics were placed in operation.

The carrying out of such large volumes of construction-installation work was the result of having supplied the construction organizations with mechanization equipment and having disseminated on an extensive scale the leading methods for organizing labor and many patriotic initiatives.

At the end of 1980, the ministry's machine pool numbered more than 35,000 principal units, including: 9,100 single-bucket excavators, 9,400 bulldozers, 900 autograders, 600 scrapers, 17,600 cranes of various types and other equipment.

At the same time, it bears mentioning that despite the high level of machine availability for the construction organizations, the quality of the machine pool leaves a great deal to be desired. The average power rating for the machines is low and the percentage of worn out equipment is high.

The machine pool was augmented not only by obtaining equipment from industry but also by producing the required machines at enterprises subordinate to the ministry. During the five-year period, the following items of equipment were produced: 1,180 cranes of various types, 86 truck-mounted concrete pumps, 579 hydraulic jacks, 3,118 standard kits for various types of construction work, 1,664 plastering and 678 painting stations and other means of mechanization -- for an overall total of approximately 220 million rubles.

The equipping of the construction organizations with mechanization equipment and improving their utilization made it possible during the Tenth Five-Year Plan to reduce the specific volumes of work performed manually, including earthwork -- by 16.4 percent, concrete and reinforced concrete -- 17 percent, plastering -- 24.9 percent and painting -- 16.8 percent; loading and unloading: of non-metallic materials -- 36.4 percent, timber, metal and construction structures -- 33.6 percent and cement -- by 53.4 percent.

During the Eleventh Five-Year Plan, the builders of USSR Mintyazhstroy must carry out more than 30 billion rubles worth of SMR [stroitel'no-montazhnaya rabota; construction-installation work], an amount which exceeds to a considerable degree the work volume carried out during the Tenth Five-Year Plan.

Considerable increases are taking place in the work volumes being carried out in ferrous and non-ferrous metallurgy, machine building and the branches of Group "B."

The first phase of the Krasnoyarsk plant for heavy duty excavators -- a large machine building enterprise which, in terms of its capability, can be compared to the renowned Uralmash [Ural Heavy Machinery Plant imeni Sergo Ordzhonikidze] -- must be placed in operation.

The chief feature of the new five-year plan is that of converting over to the new system for evaluating the work of construction organizations based upon finished marketable construction output. This imposes several requirements upon us: resources, including mechanization equipment, must be concentrated at ongoing construction projects, the placing in operation of projects and capabilities must be accelerated and a sharp reduction must be achieved in unfinished construction work.

In his speeches, Comrade L.I. Brezhnev has emphasized that there is only one path to be followed for successfully solving the diverse economic and social tasks confronting the country: rapid growth in labor productivity and a sharp increase in the efficiency of all public production.

During the new five-year plan, as is well known, a shortage of labor resources will be experienced. Thus the fulfillment of our plans is completely dependent upon fulfillment of the plan for labor productivity. We are being required to achieve a considerable increase in labor productivity. The ministry plans to achieve one third of this increase through improvements in the mechanization and automation of construction processes.

The work directed towards raising labor productivity will be based upon the carrying out of special purpose all-round programs for improving the organization, technology and mechanization of the principal types of work during the five-year period.

One of the most labor-consuming operations in construction is that of concrete work, the carrying out of which, in organizations of the ministry, involves the work of 86,000 individuals (18 percent of the overall number of workers engaged in construction). Approximately 50 percent of them carry out this work manually, without the use of machines or mechanisms. For the purpose of reducing the labor expenditures for this work, the ministry developed a special purpose program which calls for a radical technical re-equipping of those construction organizations engaged in carrying out concrete work. This program consists of three directions to be followed for reducing labor expenditures and raising labor productivity, the principal ones of which have to do with mechanizing the work of preparing, transporting and laying the concrete mixture. Within the ministry's system, this work is being carried out by 37,000 concrete workers and more than 5,000 operators of concrete laying machines (mainly cranes); secondly, a reduction in labor expenditures for the preparation of cement molds, involving the work of 20,200 carpenters.

A reduction in labor expenditures for the laying of concrete, which constitutes more than one half of all labor expenditures for the carrying out of concrete work, calls for a program aimed at converting over from laying operations involving the use of buckets and load-lifting cranes to laying operations involving the use of transport-concrete laying complexes (truck-mounted concrete mixers and truck-mounted concrete pumps). By the end of the five-year plan, up to 35 percent of the overall volume of monolithic concrete will be laid using this method.

The equipping of specialized construction subunits with concrete laying complexes will be completed for the most part during this current five-year period. Towards this end and in addition to obtaining equipment from industry, the plans call for the production at plants of the ministry of a large number of BN-80-20 and BN-80-30 truck-mounted concrete pumps having a productivity of up to 65 cubic meters per hour, including those for winter use, making it possible to lay a concrete mixture at a temperature of $-30^{\circ}C$ and truck-mounted concrete mixers with a drum capacity of 6-9 cubic meters, including those for winter use, and other means of mechanization.

In addition to raising labor productivity during concrete operations, the introduction of concrete laying complexes will also make it possible to release a large number of cranes presently being used for the laying of concrete mixtures, prevent concrete losses during transportation in dump trucks and it will also improve the quality of the projects and structures being erected by ensuring high quality preparation and laying of the concrete.

Plastering work constitutes an equally laborious process in construction production. Such work is being performed by more than 8 percent of the overall number of workers engaged in SMR within the ministry. More than one half of them are carrying out this work manually. This situation can be alleviated by the "Special Purpose Branch Program for Improving the Organization, Technology and Mechanization of Plastering Work in USSR Mintyazhstroy for the 1981-1985 Period."

This program calls for measures which will make it possible to raise labor productivity by 21 percent for this type of work. Such growth must be achieved in large measure by a raised level of mechanization, through the all-round mechanization of plastering operations and through the use of a progressive technology and light mechanization equipment.

In the interest of achieving further mechanization of the plastering operations, the ministry's plants will produce 1,750 plastering stations, 1,200 standard kits, 5,500 solution pumps and a number of other items of light mechanization.

In the broad sense, the process of improving the technology of modern construction production dictates the need for reducing all wet processes to a minimum and, with the passage of time, to generally eliminate these labor-consuming types of work.

By the end of the five-year plan, all of the plastering brigades and crews should be equipped with standard kits and other progressive means for mechanizing plastering operations.

Painting work is equally laborious. Of the overall number of workers carrying out such work in the ministry, more than 60 percent are doing so manually. Thus the plans call for measures which will raise the labor productivity of painters by 25 percent. This will be accomplished by technological improvements, by raising the level of mechanization and through the all-round mechanization of painting operations.

Simultaneous with plans for obtaining equipment from industry, the ministry is calling for an increase in the availability of machines for construction work from 22.02 percent in 1980 to 25 percent in 1985 and to increase the production of mechanization equipment at plants of the ministry from 43 million rubles worth in 1980 to 60 million rubles worth in 1985.

A great amount of work remains to be carried out by the organizers of construction production and the machine operators in order to draw as yet unused reserves into operations. The plans call for a reduction of 30-35 percent in intra-shift idle time, for an increase of 15-20 percent in shift work above the actual figure for 1980 and for an increase in output per unit of power capacity for the principal construction machines, including single-bucket excavators, from 44 in 1981 to 46.5 cubic meters per hour for an average cubic meter of bucket capacity in 1985, for scrapers from 3 to 3.5 cubic meters per hour respectively and for bulldozers -- from 14.5 to 15.8 cubic meters per hour for 1 average bulldozer with a quoted thrust of 6 tons of force.

For achieving these indicators, the ministry plans to provide the machine pool with centralized technical services on an extensive scale. This in turn calls for the production and introduction of approximately 700 mobile workshops for the technical servicing of equipment.

Improvements in the indicators for the machine pool will be influenced to a great degree by an expansion in the use of the brigade contract, the introduction of which is to be raised by the end of the five-year plan to 60 percent for SMR, including earth work which will involve more than one half of the pool of principal construction machines.

A socialist competition serves as an efficient reserve for raising labor productivity. In the interest of making the best use of such a competition, one particular form, a so-called "working competition," is being developed in a successful manner at some of the more important underway and other projects. In addition, a competition will be launched among the workers based upon the personal (brigade) production plans, with a work evaluation in natural indicators and also other forms of labor rivalry.

During the Tenth Five-Year Plan, new forms of labor organization and valuable initiatives and undertakings by leading workers and production innovators were developed and disseminated on an extensive scale at construction projects of the ministry. Some of the more popular of these initiatives and undertakings included the CC CPSU approved patriotic initiative of the Sverdlov workers entitled "Five-Year Task of the Brigade With a Reduced Staff," the initiatives of the Rostov workers entitled "To Work Without Laggards," "To Build Ahead of Schedule and To Master Ahead of Schedule" and others.

The brigade contract method continues to undergo further development. In 1980, for the complex-mechanized processing and transporting of soil, 115.4 million cubic meters of soil were processed and transported by contractual brigades. This constituted 42 percent of the overall quantity of soil processed and transported throughout the ministry on the whole and during the current five-year plan this method calls for the processing and transporting by means of motor transport of 168.8 million cubic meters of soil.

The operational experience accumulated by an enlarged complex-mechanized brigade headed by V.I. Potapov, during the erection of industrial and housing projects, has been disseminated extensively. This brigade, which brings together machine operators from the Stroymekhanizatsiya-2 Trust and motor vehicle drivers from the Sverdlovskstroytrans Trust of Glavsreduralstroy, carried out 2.2 million rubles worth of work in 1980. Labor productivity here reached 59,000 rubles per individual machine operator annually, or almost 20 percent higher than in 1979. The savings in estimated cost amounted to 35,700 rubles. For eminent achievements in his work, V.I. Potapov was awarded the State Prize of the USSR.

There are 421 complex-mechanized contractual brigades in operation at construction projects of the ministry and in addition to processing soil they are also procuring and transporting non-metallic materials and precast reinforced concrete structures.

The number of such brigades is increasing steadily. Permit me to cite just several collectives which have achieved high results. There is the brigade of machine operators at the Dneproekskavatsiya Trust headed by A.A. Kryshen' and the brigade at the Kazmetallurgstroy Trust headed by F.T. Minakov.

For further improving the organization of labor during the Eleventh Five-Year Plan, a leading role will be played by the extensive dissemination of the open flow line brigade contract, based upon improved engineering preparation and production-technological staffing and taking into account the new initiatives and the valuable experience of leading production workers. In the process, great importance is being attached to reducing manual labor based upon the complex mechanization of labor-consuming processes and this is reflected in the new initiative of leading brigades of construction organizations of Glavsreduralstroy which, jointly with creative groups of engineering-technical workers, undertook to work under the slogan: "For each brigade -- mechanized labor on an engineering basis" and to achieve a high level of labor productivity. Thus, in conformity with this initiative, the brigade of concrete workers headed by A.A. Gorinkov (Promzhilstroy Construction Administration of Tagilstroy PSMO) undertook the obligation of raising its level of mechanization from 60 to 90 percent. This will enable it to fulfill its five-year task in 4 years and 2 months and release from the brigade's table of organization two individuals engaged in manual labor. A creative group of ITR [engineering and technical personnel] from the construction administration, headed by senior construction supervisor S.V. Lukinov, vowed to furnish assistance to the brigade of concrete workers in mechanizing the entire complex of operations based upon scientific achievements and leading production experience. Similar obligations have been undertaken by other brigades and creative groups of ITR attached to Glavsreduralstroy.

The valuable initiatives of leading collectives have been examined and approved by the ministry's board, jointly with the central committee of the professional trade union. Their experience is being disseminated extensively at construction projects of USSR Mintyazhstroy.

In order to carry out successfully the tasks assigned in the sphere of mechanizing SMR, a requirement definitely exists for assistance and participation by the machine building industry. During the Eleventh Five-Year Plan, it must supply the construction ministries, departments and organizations with more productive and more powerful equipment, such that the construction equipment pool will be restored during the five-year plan, with obsolete machines and those whose service lives have elapsed being replaced completely.

For the purpose of developing frozen and rocky ground, the volume of which for our ministry is 250-270 million cubic meters, an increase must take place in the deliveries of bulldozers having attachable ripping equipment and operating with tractors having power ratings of 300 or more horsepower; for installation work, there will be a requirement for boom cranes on rubber tires and cranes on special undercarriages having a lifting capability of 40.63 tons or more, pipe laying units with a lifting capability of 15-30 tons and tower cranes of 10 tons or more for the construction of multiple story buildings. The carrying out of earth work will require an increase in the deliveries of single-bucket excavators having a bucket capacity of 2.5 cubic meters and scrapers with a 15-25 cubic meter capacity and also deliveries of automatic mobile concrete units having a productivity of 15-30 cubic meters per hour, including for work during the winter at temperatures down to -30°C, truck mounted concrete carriers, truck mounted concrete pumps and other means of mechanization.

A sharp increase is also required in the delivery volumes for construction-finishing machines and mechanized instruments, with their nomenclature ensuring the all-round mechanization of finishing operations.

For the purpose of improving the utilization of the construction machine pool, an increase is required in the deliveries of TO [technical department] equipment, including mobile fuel and oil replenishment stations, machines for rendering technical assistance, trailers with 60 ton capacities to work with tractors for transporting construction equipment, mobile diagnostic stations and other equipment.

The deliveries of spare parts and units for the repair of highway engineering machines must be increased by 2-3 times and the capital repair of mechanization equipment that is in short supply must be organized, including deep and general purpose vibrators, current frequency converters and other means of mechanization.

In conclusion I wish to state that only by making maximum use of mechanization equipment will the builders of USSR Mintyazhstroy be able to solve the task of raising the efficiency of labor and fulfilling the tasks outlined during the 26th CPSU Congress.

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